Electronic Version
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Claims

[c1] What is claimed is:

1. A method for controlling wireless communication between a first station and a second station, the first station having a buffer memory, a first memory block of the buffer memory being allocated to a first radio bearer for storing data units requested to be transmitted to the second station through the first radio bearer, the method comprising the steps of:

(a) establishing a second radio bearer between the first station and the second station;

(b) reconfiguring the first memory block, and allocating a second memory block of the buffer memory to the second radio bearer for storing data units requested to be transmitted to the second station through the second radio bearer; and

(c) blocking the first station from passing a first data unit to the first memory block if the first memory block is unable to accommodate the first data unit, wherein the first data unit is requested to be transmitted to the second station through the first radio bearer.

[c2] 2. The method of claim 1 further comprising blocking

the first station from passing a second data unit to the second memory block if the second memory block is unable to accommodate the second data unit, wherein the second data unit is requested to be transmitted to the second station through the second radio bearer.

[c3] 3. The method of claim 2 wherein the first station stops processing the first data unit if the first memory block is full, and the first station stops processing the second data unit if the second memory block is full.

[c4] 4. The method of claim 1 wherein step (b) further comprises reducing the first memory block within the buffer memory for reconfiguring the first memory block.

[c5] 5. The method of claim 1 wherein step (b) further comprises keeping data units stored within the buffer memory when the second memory block is allocated.

[c6] 6. A method for controlling wireless communication between a first station and a second station, the first station having a buffer memory, a first memory block of the buffer memory being allocated to a first radio bearer for storing data units transmitted from the second station through the first radio bearer, the method comprising the steps of:

(a) establishing a second radio bearer between the first

station and the second station;

(b) allocating a second memory block of the buffer memory to the second radio bearer for storing data units transmitted from the second station through the second radio bearer; and

(c) if a capacity of the second memory block available to the second radio bearer is less than a total capacity of the second memory block allocated to the second radio bearer, driving the first station to output a control message to the second station for adjusting a size of a transmission window of the second station for the second radio bearer, wherein the transmission window delimits a number of protocol data units, called PDUs hereafter, which are allowed to transmit on the second radio bearer.

[c7] 7. The method of claim 6 further comprising keeping data units stored within the buffer memory when the second memory block is allocated.

[c8] 8. The method of claim 6 wherein the size of the transmission window of the second station for the second radio bearer is adjusted to be equal to the capacity of the second memory block available to the second radio bearer when the second station receives the control message from the first station.

9. The method of claim 6 wherein step (b) further com-

prises reducing the first memory block within the buffer memory for allocating the second memory block within the buffer memory.

[c9] 10. The method of claim 6 wherein step (c) further comprises driving the first station to output the control message for increasing the size of the transmission window of the second station for the second radio bearer if the capacity of the second memory block available to the second radio bearer is increased by a predetermined amount of space.

[c10] 11. The method of claim 10 wherein if the capacity of the second memory block increased by the predetermined amount of space reaches the total capacity of the second memory block, the first station outputs the control message to adjust the size of the transmission window of the second station for the second radio bearer to be equal to a configured size when the second radio bearer is established.

[c11] 12. The method of claim 10 wherein step (c) further comprises driving the first station to periodically check if the capacity of the second memory block available to the second radio bearer is increased.

[c12] 13. The method of claim 6 wherein before the second

memory block starts storing data units transmitted from the second station through the second radio bearer, the first station outputs the control message for decreasing the size of the transmission window of the second station for the second radio bearer if the capacity of the second memory block available to the second radio bearer is less than the total capacity of the second memory block allocated to the second radio bearer.

[c13] 14. A method for controlling wireless communication between a first station and a second station, the first station having a buffer memory, a first transmission window being configured within the buffer memory for accommodating data units allowed to be transmitted to the second station through a first radio bearer, wherein data units not accommodated in the first transmission window are not allowed to transmit through the first radio bearer before at least one PDU of lowest sequence number accommodated in the first transmission window is positively acknowledged to be received, the method comprising the steps of:

(a) establishing a second radio bearer between the first station and the second station;

(b) reconfiguring the first transmission window, and configuring a second transmission window within the buffer memory for accommodating data units allowed to

be transmitted to the second station through the second radio bearer; and

(c) if the buffer memory excluding the second transmission window is unable to accommodate a first new data unit requested to be transmitted to the second station through the first radio bearer, blocking the first station from passing the first new data unit to the buffer memory.

[c14] 15. The method of claim 14 further comprising:

when the buffer memory excluding the second transmission window is capable of accommodating the first new data unit, storing the first new data unit into the buffer memory.

[c15] 16. The method of claim 15 further comprising:

if the first transmission window is capable of accommodating the first new data unit, storing the first new data unit into the first transmission window.

[c16] 17. The method of claim 14 further comprising:

if the buffer memory excluding the first transmission window is unable to accommodate a second new data unit requested to be transmitted to the second station through the second radio bearer, blocking the first station from passing the second new data unit to the buffer memory.

[c17] 18. The method of claim 17 further comprising:
when the buffer memory excluding the first transmission window is capable of accommodating the second new data unit, storing the second new data unit into the buffer memory.

[c18] 19. The method of claim 18 further comprising:
if the second transmission window is capable of accommodating the second new data unit, storing the second new data unit into the second transmission window.

[c19] 20. The method of claim 14 wherein the first station stops processing the new data unit if the buffer memory is full.

[c20] 21. The method of claim 14 wherein step (b) further comprises keeping data units stored within the buffer memory when the second transmission window is configured.

[c21] 22. A sender in wireless communication with a receiver, the sender allocating a first memory block to a first radio bearer for storing data units requested to be transmitted to the receiver through the first radio bearer, the sender comprising:
a buffer memory for allocating the first memory block;
a communication interface electrically connected to the

buffer memory for establishing a second radio bearer between the sender and the receiver, reconfiguring the first memory block, and allocating a second memory block of the buffer memory to the second radio bearer for storing data units requested to be transmitted to the receiver through the second radio bearer; and
a decision logic electrically connected to the communication interface for blocking the communication interface from passing a first data unit to the first memory block if the first memory block is unable to accommodate the first data unit, wherein the first data unit is requested to be transmitted to the receiver through the first radio bearer.

[c22] 23. The sender of claim 22 wherein the decision logic blocks the communication interface from passing a second data unit to the second memory block if the second memory block is unable to accommodate the second data unit, wherein the second data unit is requested to be transmitted to the receiver through the second radio bearer.

[c23] 24. The sender of claim 23 wherein the communication interface stops processing the first data unit if the decision logic detects that the first memory block is full, and the communication interface stops processing the second data unit if the decision logic detects that the sec-

ond memory block is full.

[c24] 25. The sender of claim 22 wherein the communication interface reduces the first memory block within the buffer memory for reconfiguring the first memory block.

[c25] 26. The sender of claim 22 wherein the communication interface keeps data units stored within the buffer memory when the second memory block is allocated.

[c26] 27. A receiver in wireless communication with a sender, the receiver allocating a first memory block to a first radio bearer for storing data units transmitted from the sender through the first radio bearer, the receiver comprising:
a buffer memory for allocating the first memory block;
a communication interface electrically connected to the buffer memory for establishing a second radio bearer between the sender and the receiver, and allocating a second memory block of the buffer memory to the second radio bearer for storing data units transmitted from the sender through the second radio bearer; and
a decision logic electrically connected to the communication interface for driving the communication interface to output a control message to the sender for adjusting a size of a transmission window of the sender for the second radio bearer if a capacity of the second memory

block available to the second radio bearer is less than a total capacity of the second memory block allocated to the second radio bearer, wherein the transmission window delimits a number of protocol data units, called PDUs hereafter, which are allowed to transmit on the second radio bearer.

[c27] 28. The receiver of claim 27 wherein the communication interface keeps data units stored within the buffer memory when the second memory block is allocated.

[c28] 29. The receiver of claim 27 wherein the control message is used for adjusting the size of the transmission window of the sender for the second radio bearer to be equal to the capacity of the second memory block available to the second radio bearer.

30. The receiver of claim 27 wherein the communication interface reduces the first memory block within the buffer memory for allocating the second memory block within the buffer memory.

[c29] 31. The receiver of claim 27 wherein the decision logic drives the communication interface to output the control message for increasing the size of the transmission window of the sender for the second radio bearer if the capacity of the second memory block available to the second radio bearer is increased by a predetermined

amount of space.

[c30] 32. The receiver of claim 31 wherein if the decision logic detects that the capacity of the second memory block increased by the predetermined amount of space reaches the total capacity of the second memory block, the communication interface outputs the control message to adjust the size of the transmission window of the sender for the second radio bearer to be equal to a configured size when the second radio bearer is established.

[c31] 33. The receiver of claim 31 wherein the decision logic periodically checks if the capacity of the second memory block available to the second radio bearer is increased.

[c32] 34. The receiver of claim 27 wherein before the second memory block starts storing data units transmitted from the sender through the second radio bearer, the communication interface outputs the control message for decreasing the size of the transmission window of the sender for the second radio bearer if the capacity of the second memory block available to the second radio bearer is less than the total capacity of the second memory block allocated to the second radio bearer.

[c33] 35. A sender in wireless communication with a receiver, the sender having a first transmission window config-

ured for accommodating data units allowed to be transmitted to the receiver through a first radio bearer, data units not accommodated in the first transmission window being not allowed to transmit through the first radio bearer before at least one PDU of lowest sequence number accommodated in the first transmission window is positively acknowledged to be received, the sender comprising:

a buffer memory for allocating the first transmission window;

a communication interface electrically connected to the buffer memory for establishing a second radio bearer between the sender and the receiver, reconfiguring the first transmission window, and configuring a second transmission window within the buffer memory for accommodating data units allowed to be transmitted to the receiver through the second radio bearer; and

a decision logic electrically connected to the communication interface for blocking the communication interface from passing the first new data unit to the buffer memory if the buffer memory excluding the second transmission window is unable to accommodate a first new data unit requested to be transmitted to the receiver through the first radio bearer.

[c34] 36. The sender of claim 35 wherein the communication

interface stores the first new data unit into the buffer memory when the decision logic detects that the buffer memory excluding the second transmission window is capable of accommodating the first new data unit.

[c35] 37. The sender of claim 36 wherein if the first transmission window is capable of accommodating the first new data unit, the communication interface stores the first new data unit into the first transmission window.

[c36] 38. The sender of claim 35 wherein the decision logic blocks the communication interface from passing a second new data unit to the buffer memory if the decision logic detects that the buffer memory excluding the first transmission window is unable to accommodate the second new data unit requested to be transmitted to the receiver through the second radio bearer.

[c37] 39. The sender of claim 38 wherein the communication interface stores the second new data unit into the buffer memory when the buffer memory excluding the first transmission window is capable of accommodating the second new data unit.

[c38] 40. The sender of claim 39 wherein the communication system stores the second new data unit into the second transmission window if the second transmission window

is capable of accommodating the second new data unit.

[c39] 41. The sender of claim 35 wherein the communication interface stops processing the new data unit if the decision logic detects that the buffer memory is full.

[c40] 42. The sender of claim 35 wherein the communication interface keeps data units stored within the buffer memory when the second transmission window is configured.